

R E M A R K S

Claims 1-76 are pending and have been rejected. Via this Amendment, Claims 1-76 are cancelled and new Claims 77-103 are added herein. Support for this Amendment is found in the specification. No new matter is added via this Amendment. In view of the following remarks, reconsideration and allowance of the instant application is respectfully requested.

The Examiner is sincerely thanked for withdrawal of the Restriction Requirement.

Regarding the Information Disclosure Statement, Applicants have not been able to obtain a copy of "Nonthermal Effects of Microwave Radiation on Mammalian Cells: Experimental and Theoretical Results." Our efforts to retrieve this reference have been unsuccessful. Further, the file notes that the author informed us that this paper was never published and was only given orally at a workshop held in Rockville, MD on February 7, 1997.

Page 2-4 of the Office Action refers to numerous claim objections for grammatical and claim formatting errors. None of these objections are present in new Claims 77-103. Similarly, Claims 11, 13, 27, 34, 39, 61,63 and 74 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite.

Inasmuch as new Claims 77-103 do not contain the particular phraseology described at pages 4-7 of the Office Action, removal of this rejection is requested.

Claims 1-76 were rejected under 35 U.S.C. § 102 as anticipated by U.S. Patent No. 5,044,006 to Cyrulnik (hereinafter "the '006 Patent"). Initially, we note that the '006 Patent represents the previously issued patent of the present inventor.

Applicant traverses this rejection.

As indicated hereinabove, Claims 1-76 are cancelled and new Claims 77-103 presented. New Claims 77-103 are method of use claims directed to the processes of medical diagnosis, security screening, treating pathological conditions, performing non-invasive surgery, and regeneration of cells and tissues.

Support for Claims 77-80, directed to the process of medical diagnosis is found at paragraphs [0105] [0133] [0134] [0137] of the present specification and former Claims 1-20. Support for Claims 81-84, directed to a method of security screening is found at paragraphs [0138]-[0141] of the present specification and former Claims 21-27. Support for Claims 85-90, directed to a method for treating pathological conditions is found at Figure 3, paragraphs [0106], [0142]-[0157] of the present specification and former Claims 28-51. Support for Claims 91-93, directed to performing non-invasive surgery is found at [0107] [0163]-[0172] of the present specification and former Claims 52-63. Support for Claims 93-102 directed to a method for regeneration of cells and tissues is found at [0108], [0173]-[0175] of the specification and former Claims 64-75. Support for Claim 103 directed to a method for imaging and/or detecting a macromolecular structure is found at former Claim 76.

Unlike the present invention, the '006 Patent is directed to the original system for radiotherapy treatment. The '006 Patent is directed to treatment, not destruction of pathological material as in the present patent application. The present invention provides a novel approach utilizing microwave-modulated x-ray to irradiate a target and new methods to make use of the apparatus of the '006 Patent, such methods not being taught or suggested in the '006 Patent. Although the '006 Patent teaches how to modulate x-rays, it would not be effective for irradiating a target inasmuch as the essential feature is to determine the resonant frequency for that target. This can only be determined by visualizing the target exclusivity at that frequency. While the

fastest CT scanners can generate 20 scans per second and, therefore, can generate a scan for each frequency throughout the range as in the present application in somewhat over an hour, it would take more than 5 days to visualize a target for each candidate frequency. The present invention solves this problem. Only 1-5 pixels are reconstructed for the target area and for the area outside that for the scan at each frequency, and only when the pixels in the target are seen but not those outside the target, a resonant frequency may be presumed, as in the present invention, and a complete image can be reconstruction generated. According to the present invention, this technique adds only a few minutes at the most to the 1-2 hour scan. In fact, this can be shortened even further to few minutes by dividing the candidate frequencies into 10 bands iterively and testing those bands for a resonant frequency which show exclusive visualization of the target pixel(s).

Therefore, the '006 Patent teaches the production of microwave modulated x-rays which could be used to irradiate a subject, but does not teach or suggest the new process of the present invention which provides a method to safely and effectively do so as well as other uses for the new process. There can be no anticipation in instances where the general subject matter is the same, but the specific application or use is different. See *Union Oil Co. of California v. Atlantic Richfield Co.*, 208 F.3d 989, 54 USPQ2d 1227 (Fed. Cir. 2000), cert. denied, 531 U.S. 1183 (2001). Similarly, when a prior art process has been modified or altered, anticipation will likely not be found. For anticipation, the prior art process has been modified as indicated hereinabove, and inasmuch as it does not discloses each and every element of the present claims, it cannot anticipate same. See *Carnegie Steel Co. v. Cambria Iron Co.*, 185 U.S. 403, 424 (1902):

“A process patent...is not anticipated by a mechanism which might
with slight alterations have been adapted to carry out that process,

unless, at least, such use of it would have occurred to one whose duty it was to take practical use of the mechanism described. In other words, a process patent can only be anticipated by a similar process."

Moreover, nowhere in the '006 Patent is it taught or suggested that this system can be used for diagnosis of medical conditions. To do so would require accurate characterization of the target, which for modulated irradiation entails identifying the unique resonant frequency of the target. In the present application, this is accomplished by finding the resonant frequency of the target.

For example, small white spots on a brain scan could be due to either multiple sclerosis or multiple infarcts. These conditions are expected to have quite different absorption characteristics in terms of resonant frequency. Similarly, Alzheimer's disease and normal aging might be differentiated by different resonant frequencies in that they are not part of the same disease processes. The selected resonance frequency is that in which there is maximum absorption at each of the target detectors. However, using the apparatus of the '006 Patent for this results in false positives and false negatives. This is because CAT scanning works by dividing the x-ray beam into thin beams at various angles. If the angle of a frequency which is truly resonant for a tumor does not pass through the tumor, then the detector at that angle fails to register maximum absorption. Similarly, a non-resonant frequency may show maximum absorption if its angle passes through a normally calcified structure or bone.

While the technique of modulating X-rays with microwave frequencies, as taught in the '006 Patent represents a major advance, its use cannot be expanded to those of the present invention. That is, the apparatus of the '006 Patent reference does not teach that the apparatus

can be used to diagnose certain types of diseases by recognizing particular frequencies associated with that disease. Focusing on a particular frequency for radiation does not anticipate or render obvious, use for diagnosis of disease by utilizing a particular frequency. The '006 Patent does not teach that each disease has its associated frequency nor does it teach the methods of use as in new Claims 77-103.

Security screening today involves looking for both identifiable substances with known spectral characteristics and obscure substances. The entire spectrum of microwave frequencies must be tested for resonance in the suspected compound, much as is done for pathological tissues. The method of the present invention represents a significant advance over the '006 Patent for security screening where unreliability cannot be tolerated.

Regeneration of cells and tissues is a totally new concept not mentioned at all in the '006 Patent. It depends on finding a spectral signature between two energy levels of a molecule that will advance its differentiation program. Unlike heat and chemical means of changing the state, mediation does not require free energy, therefore a resonant frequency can match and impart just enough energy to effect a transition into the next molecular state. Since this transition may represent an adjacent state in the program, either a later one, as in the case of stem cells, or an earlier one, as in the case of degenerative diseases such as Parkinson's where the cells no longer make dopamine, the potential for treating degenerative disease is possible with the present invention. Such use is neither taught nor suggested in the '006 Patent.

Applicants therefore submit that the present invention is not obvious over the reference.

Thus, for the reasons given herein, it is respectfully submitted that the present case is in condition for allowance, which action is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is

respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,

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